

# **EPITHELIUM**

## **(EPITHELIAL TISSUE)**

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**KGMU LKO**

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# EPITHELIUM

*Epithelium is a sheath of cells with minimal intercellular space, resting on a basement membrane & lining the surface*

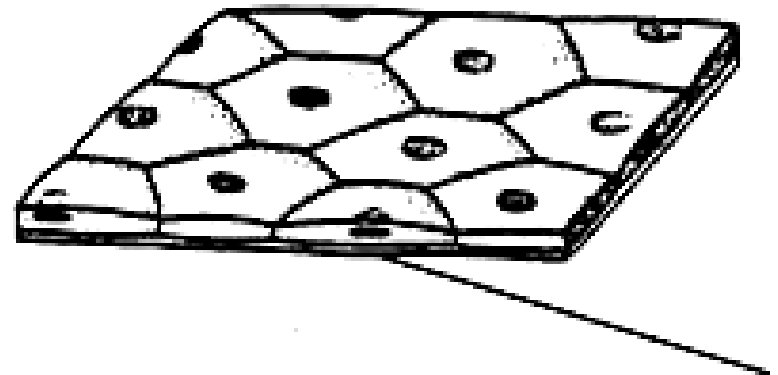
# EPITHELIUM

- Epithelium is classified on the basis of *shape* and *layers*
- **Simple** -Simple squamous
  - Simple cuboidal
  - Simple columnar
- **Stratified**-Stratified squamous
  - Stratified cuboidal
  - Stratified columnar
  - Pseudostratified epithelium
  - Transitional epithelium

# Simple Squamous Epithelium

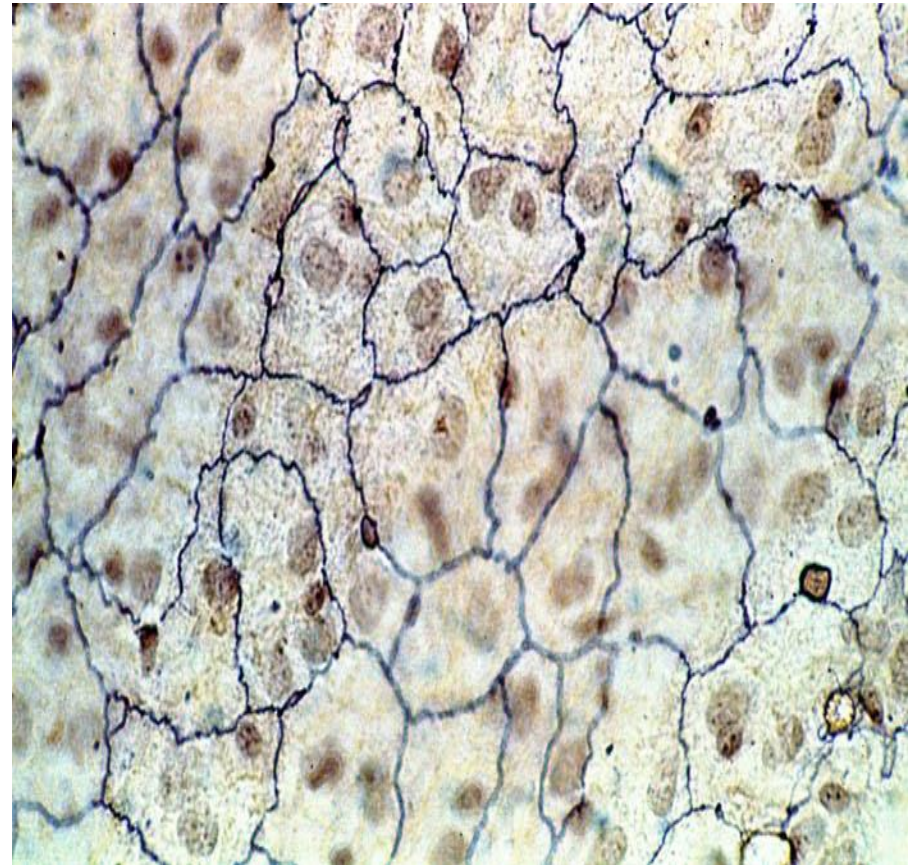
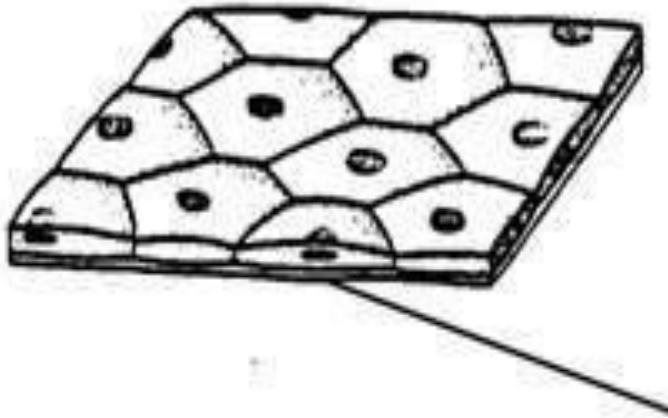
- **Single layered**
- **Flat cells**
- **Surface like scales**
- **Elevated nuclei**
- **Examples**
- **Lung alveoli, Parietal layer of bowmen's capsule of kidney**
- **Mesothelium, Endothelium**

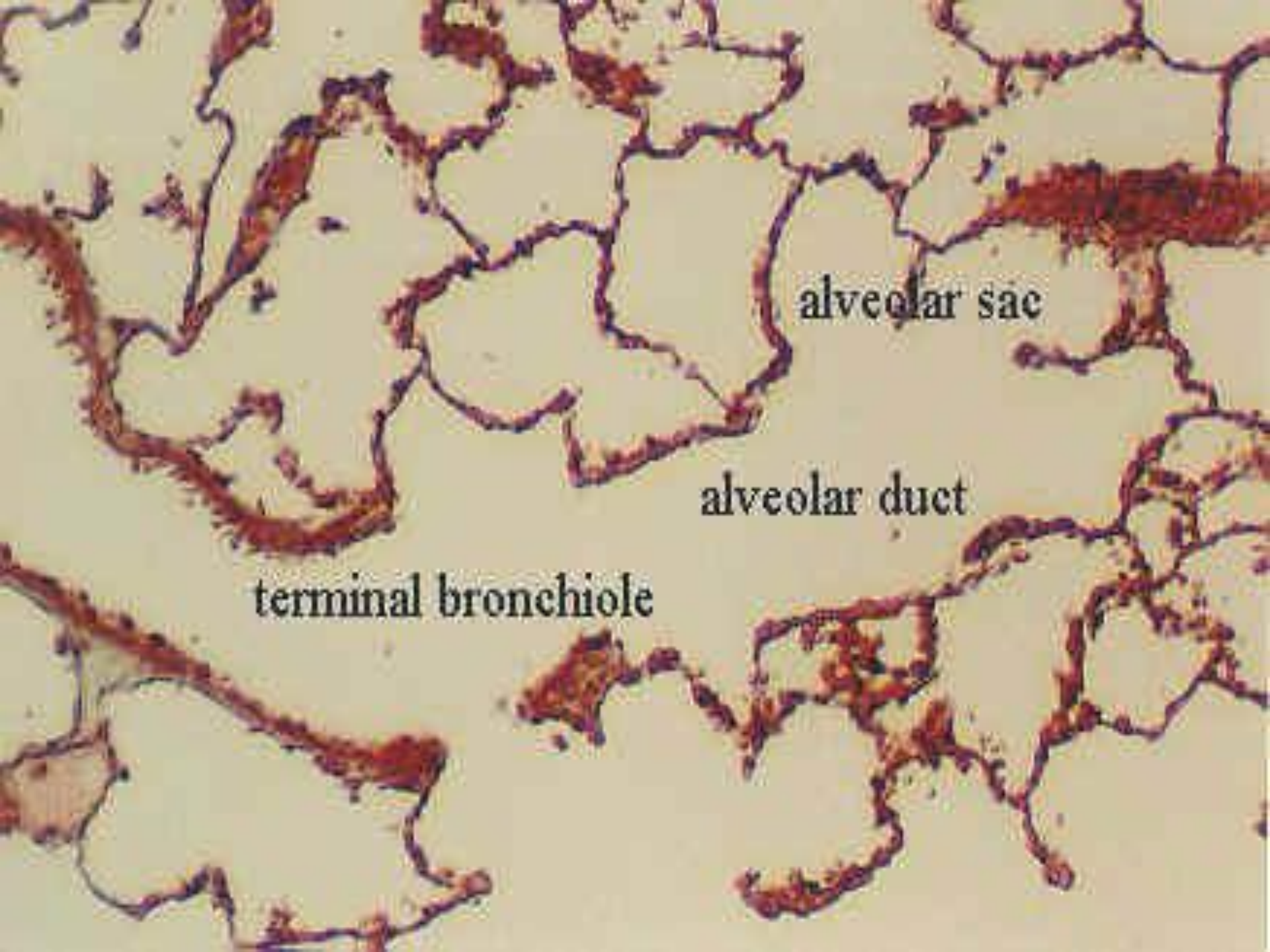
Simple squamous



# Simple Squamous Epithelium

Simple squamous





alveolar sac

alveolar duct

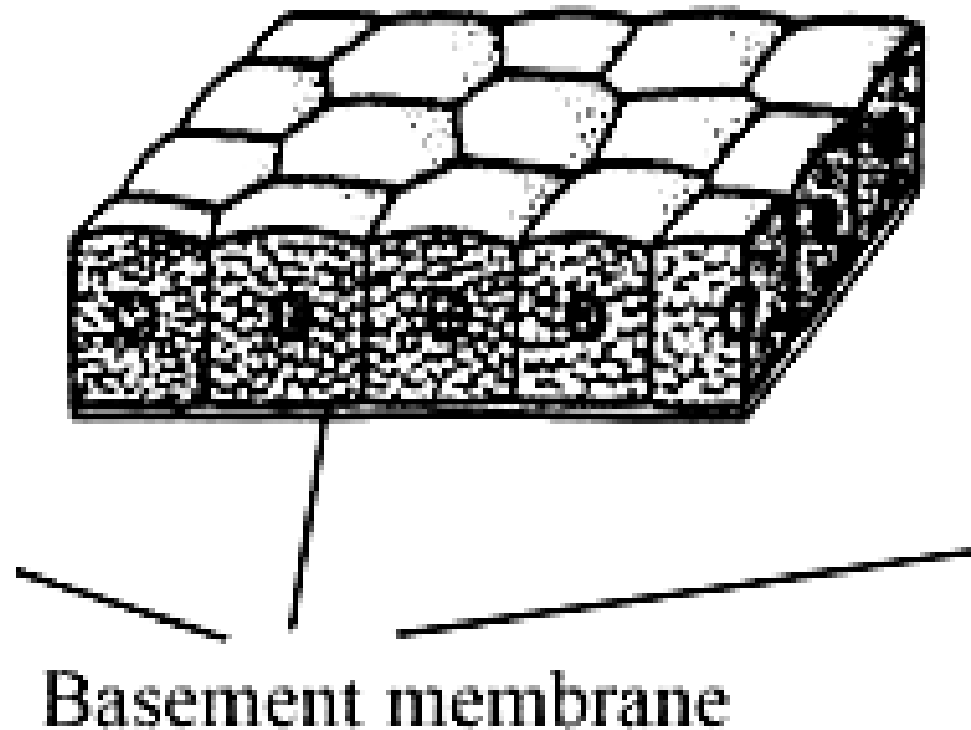
terminal bronchiole

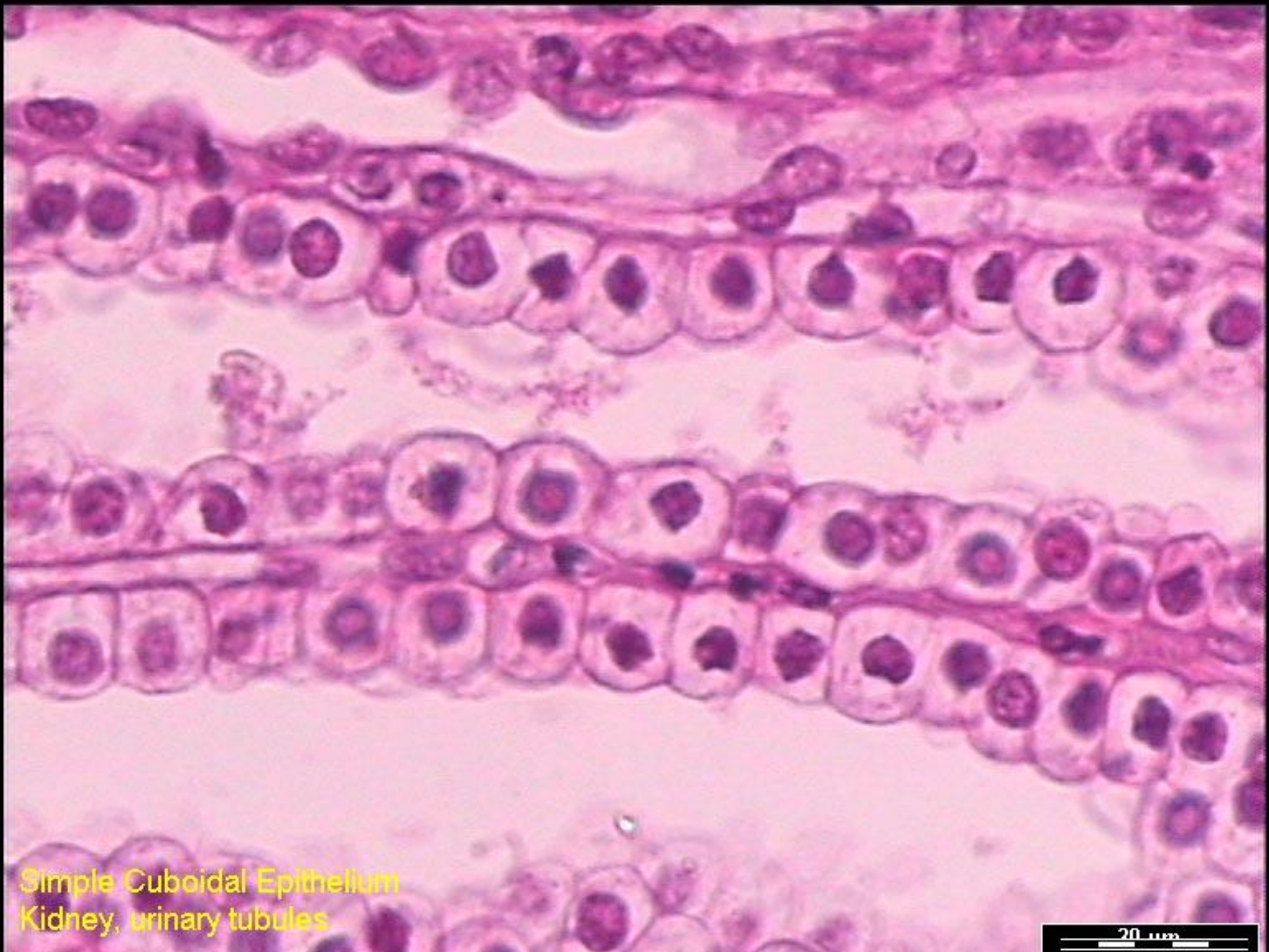


# Simple Cuboidal Epithelium

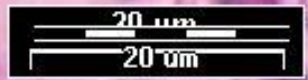
- **Single layer of cube shaped cells,**
- **Surface looks like mosaic.**
- **Examples**
- *Thyroid follicle, tubules of nephrons*
- *Pigmented layer of retina*
- *Germinal layer of ovary.*
- *Inner layer of lens.*
- *Choroid plexuses of brain*

Simple cuboidal

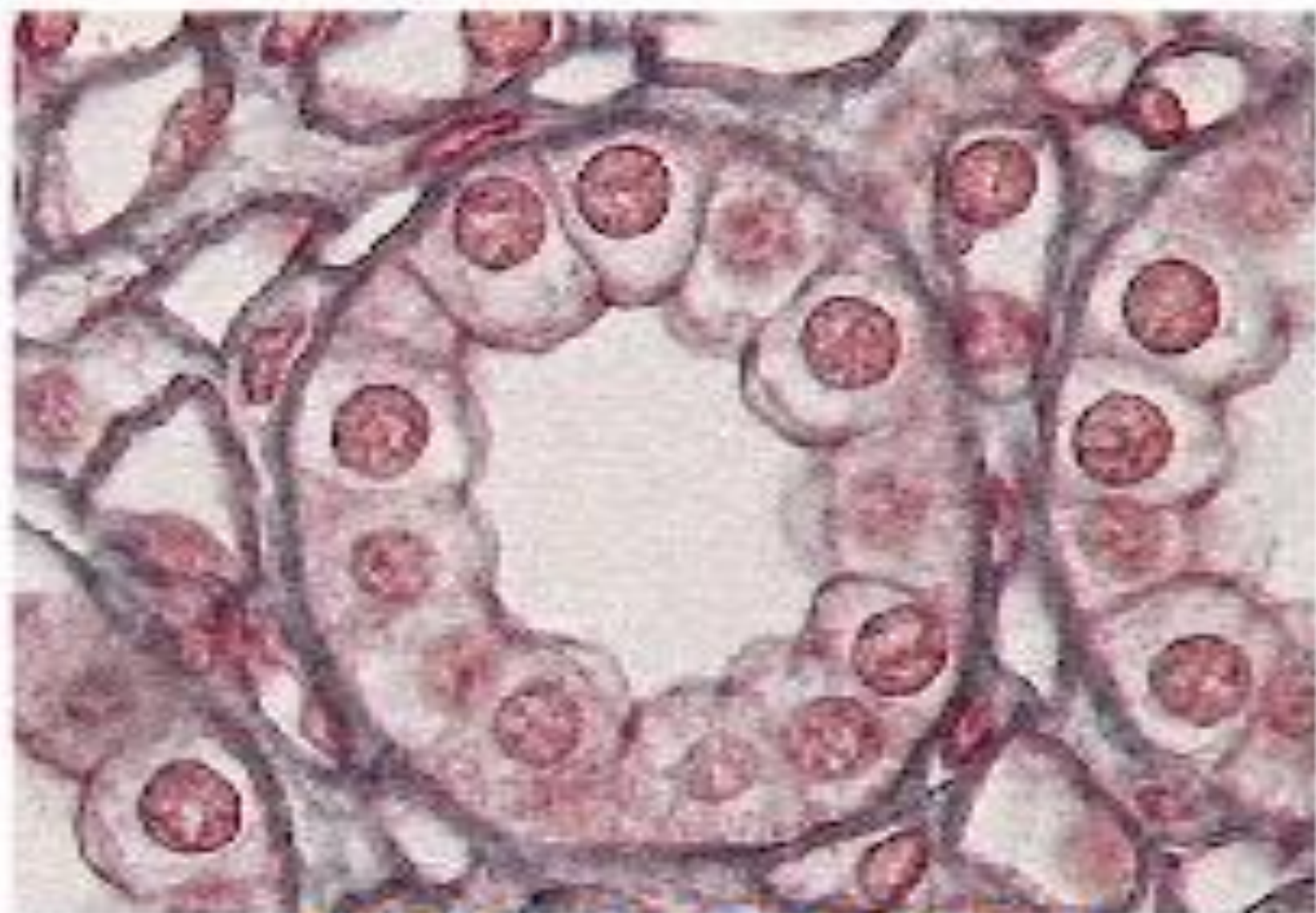




Simple Cuboidal Epithelium  
Kidney, urinary tubules





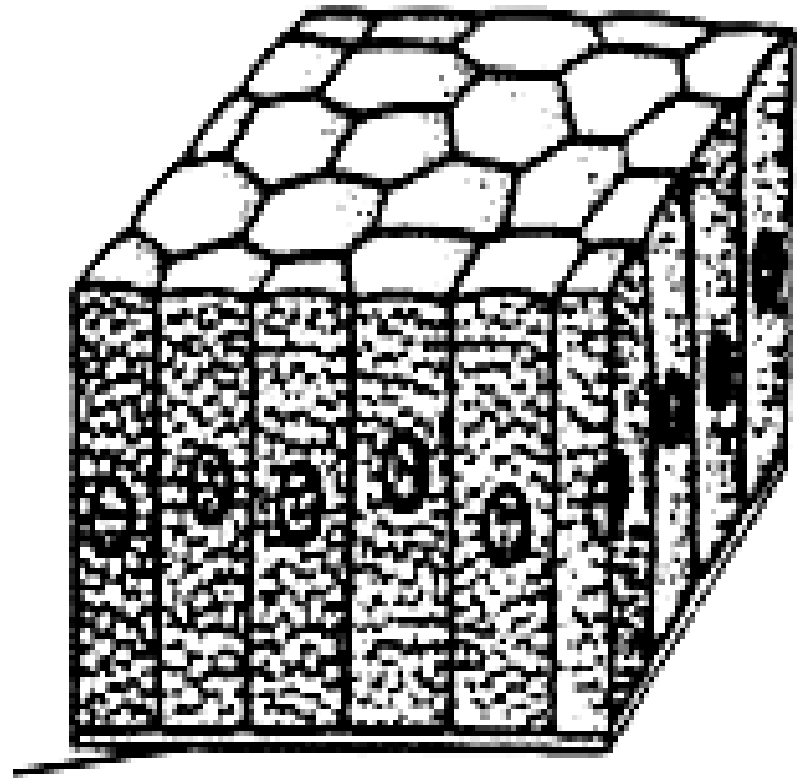


**Cuboidal Epithelium**

# Simple Columnar Epithelium

- Cells having more height than width
- Cells may show some surface
- Modifications
- **Examples**  
**Stomach, large intestine**

Simple columnar

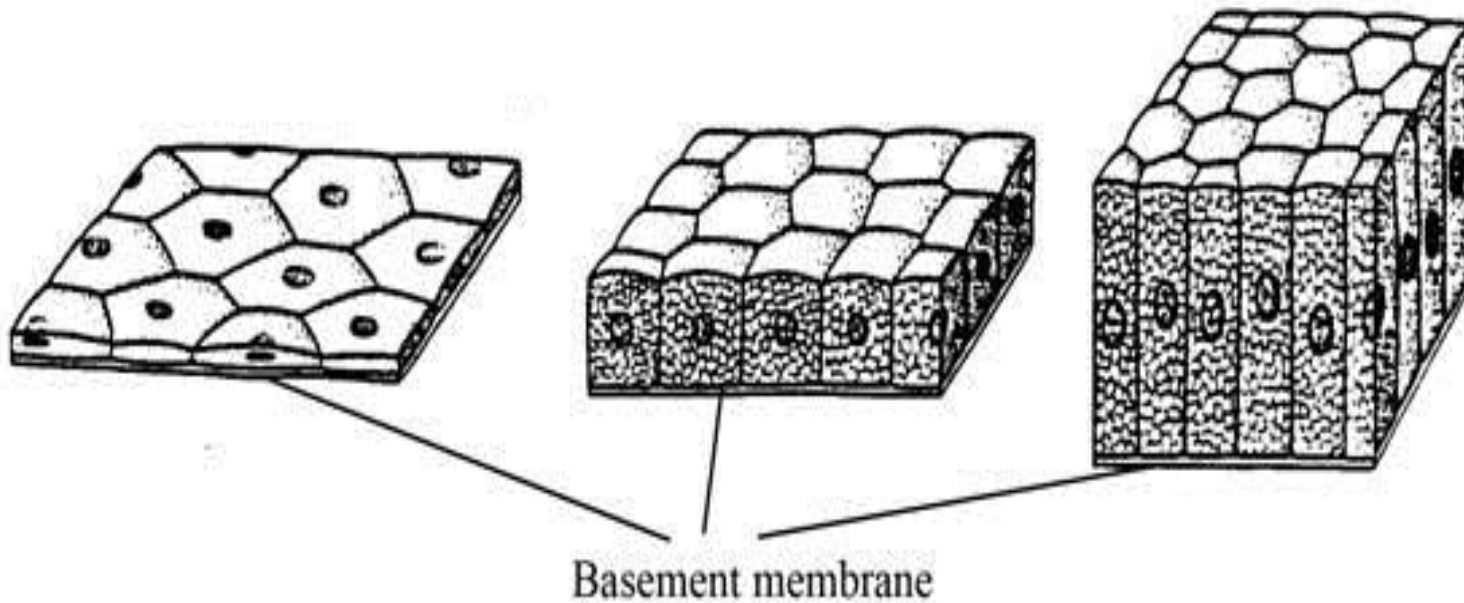


# Simple epithelium

Simple squamous

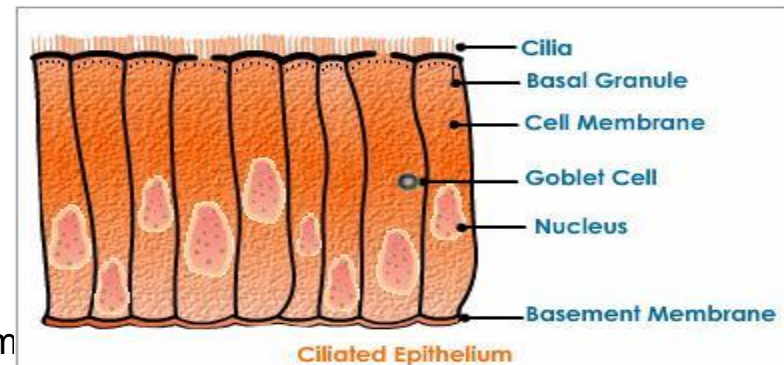
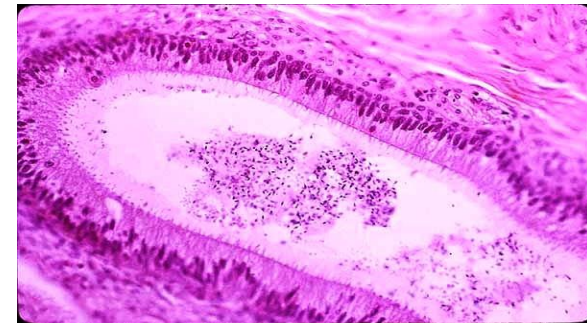
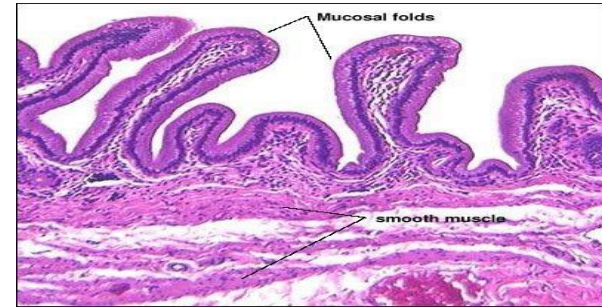
Simple cuboidal

Simple columnar

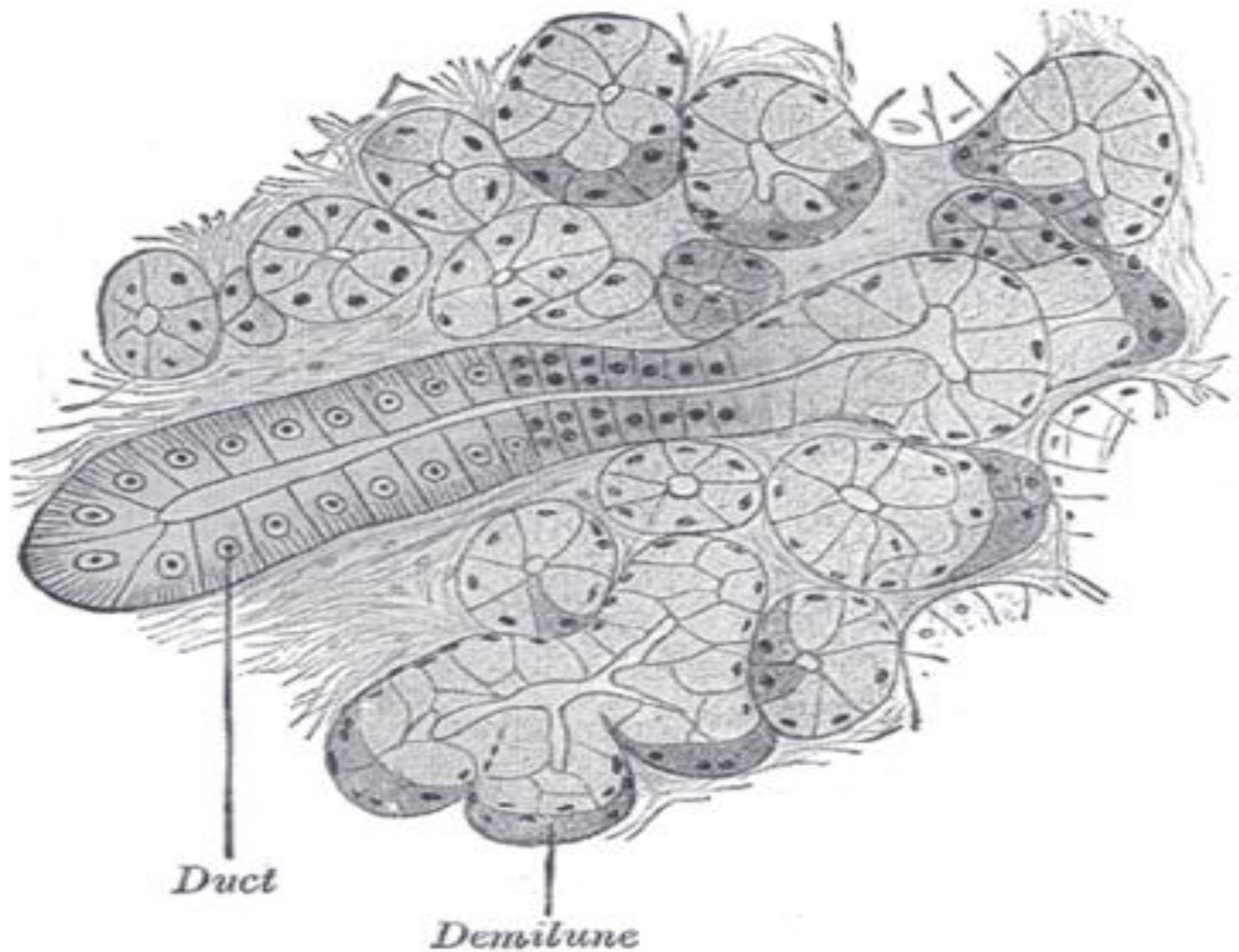


# Surface modifications

- **Striated borders**–  
-regular projections  
-microvilli  
eg; small intestine
- **Brush border**–  
-branched projections  
eg; p.c.t, gall bladder
- **Stereocilla**  
-epididymus, internal ear  
(kinocilia) olfactory cilia,
- **Cilia** –  
uterine tube, efferent ductules  
of testis, Ependyma, middle  
ear, auditory tube

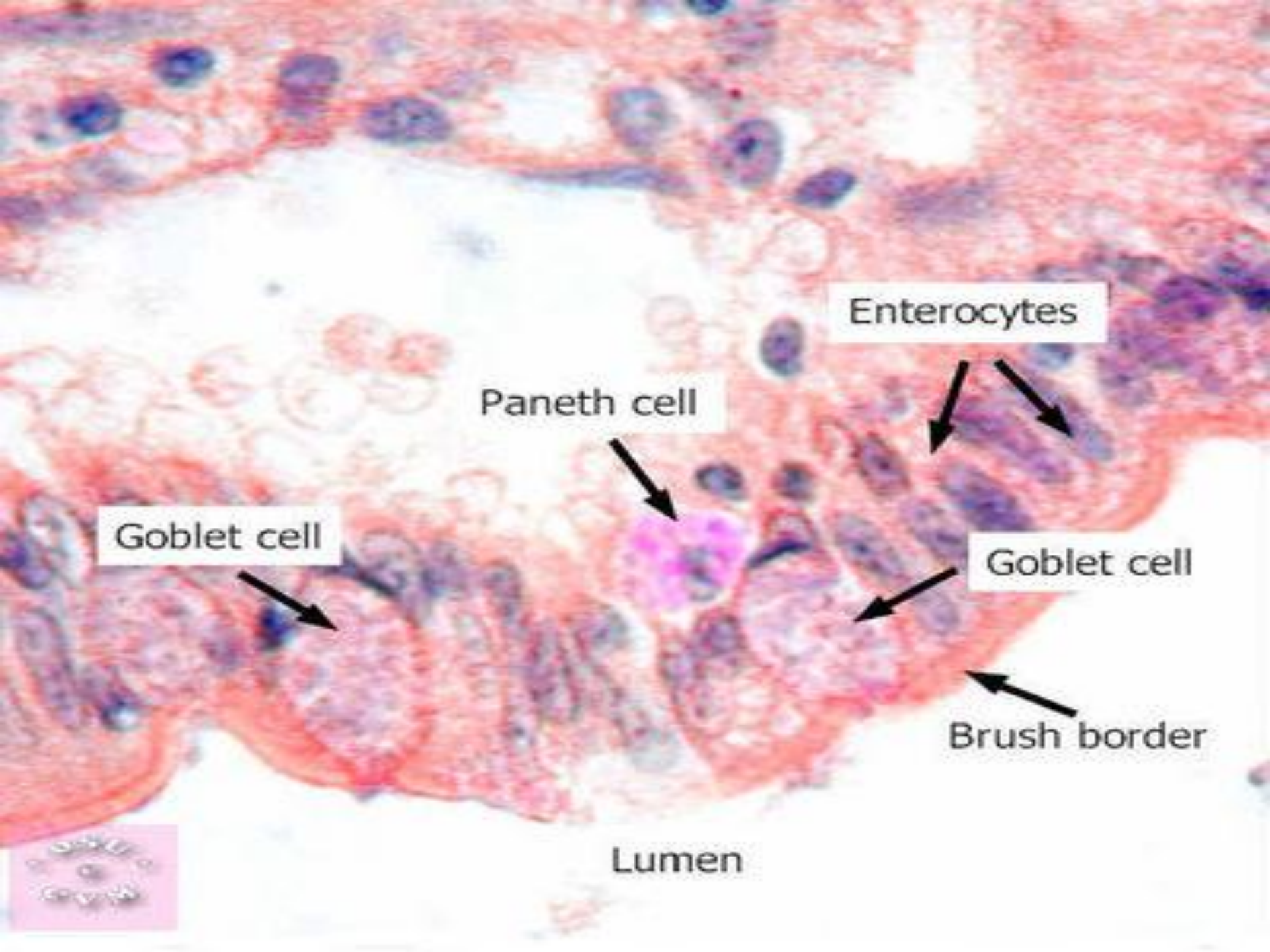






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Enterocytes

Paneth cell

Goblet cell

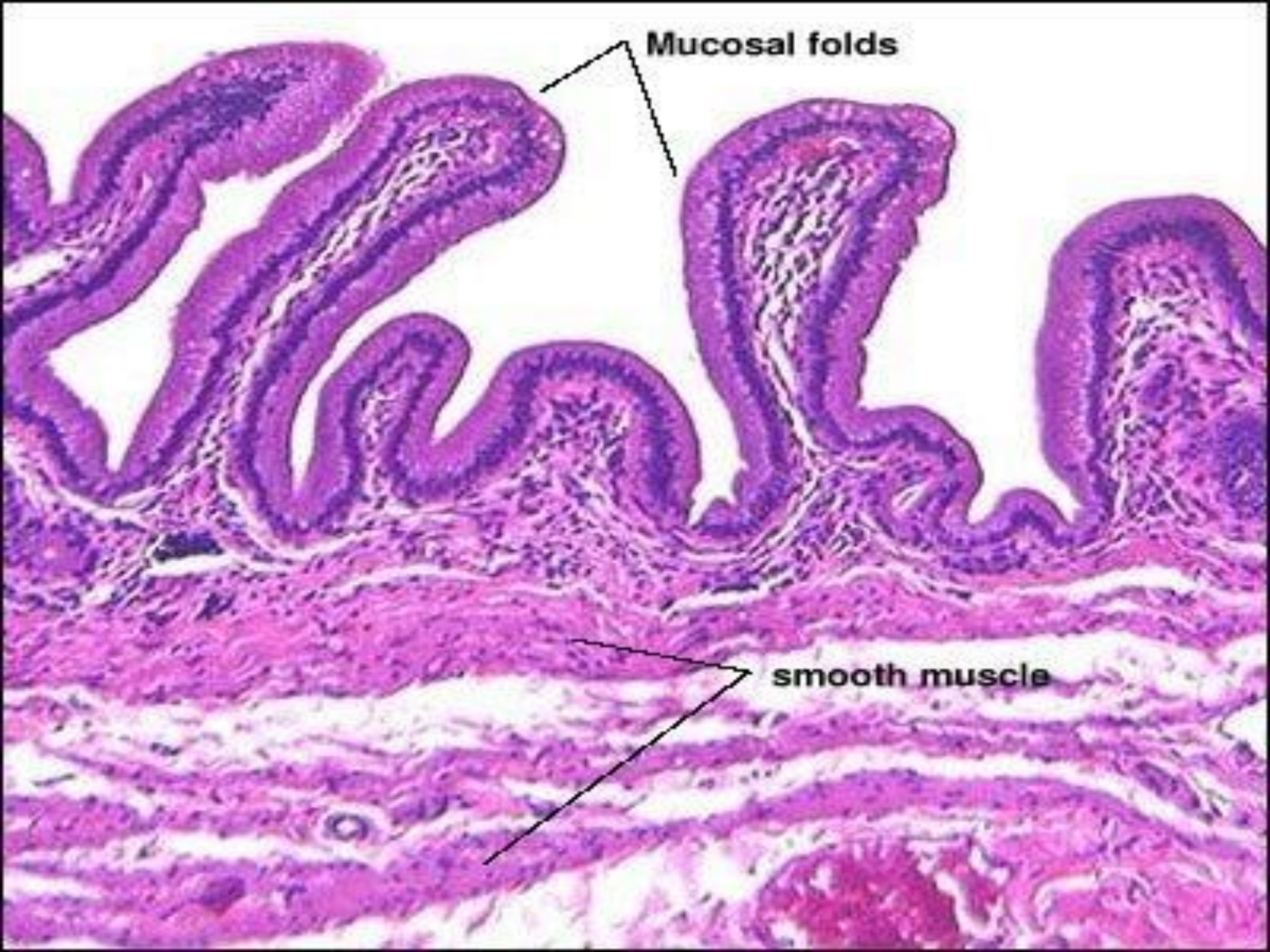
Goblet cell

Brush border

Lumen



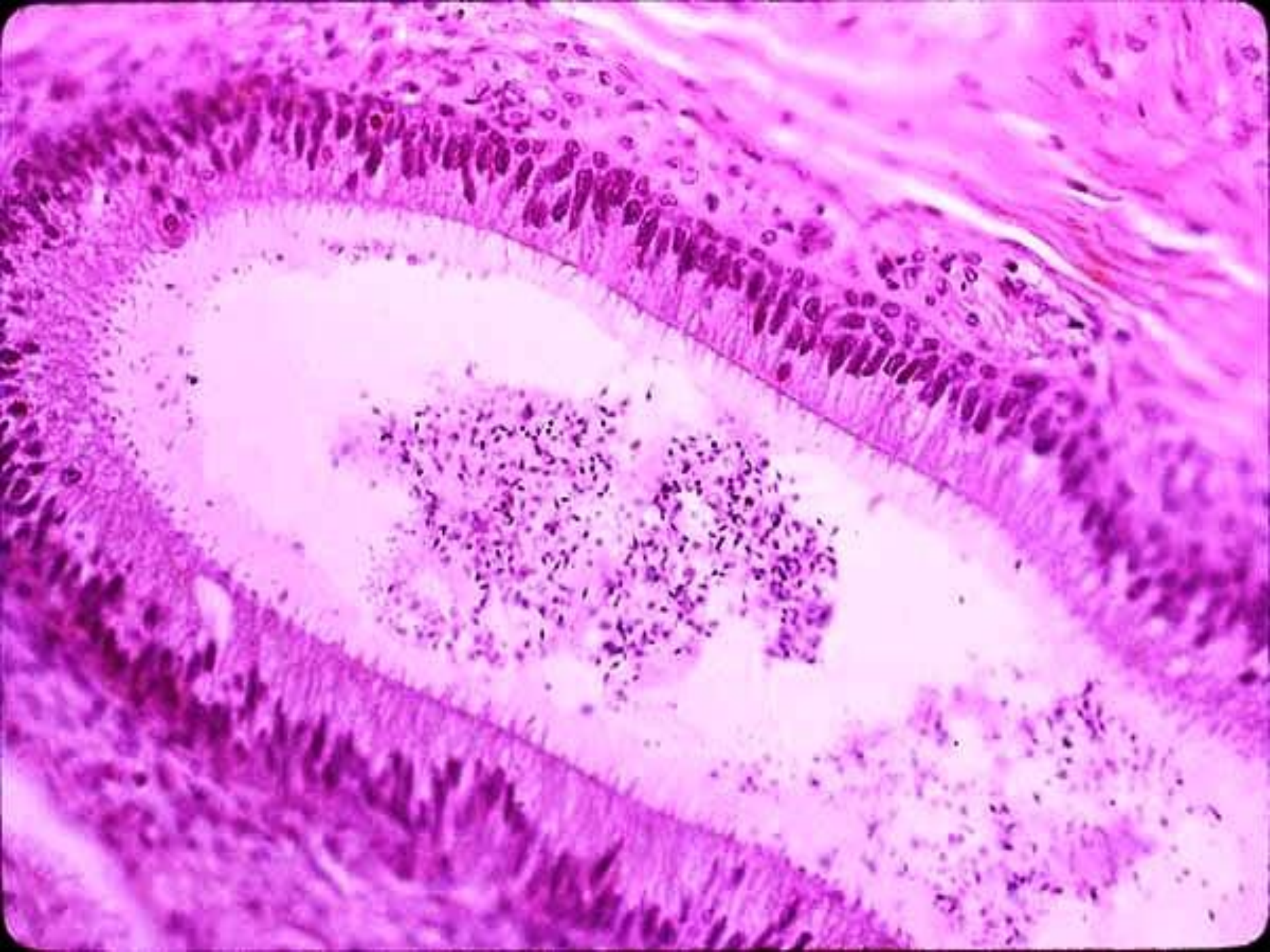




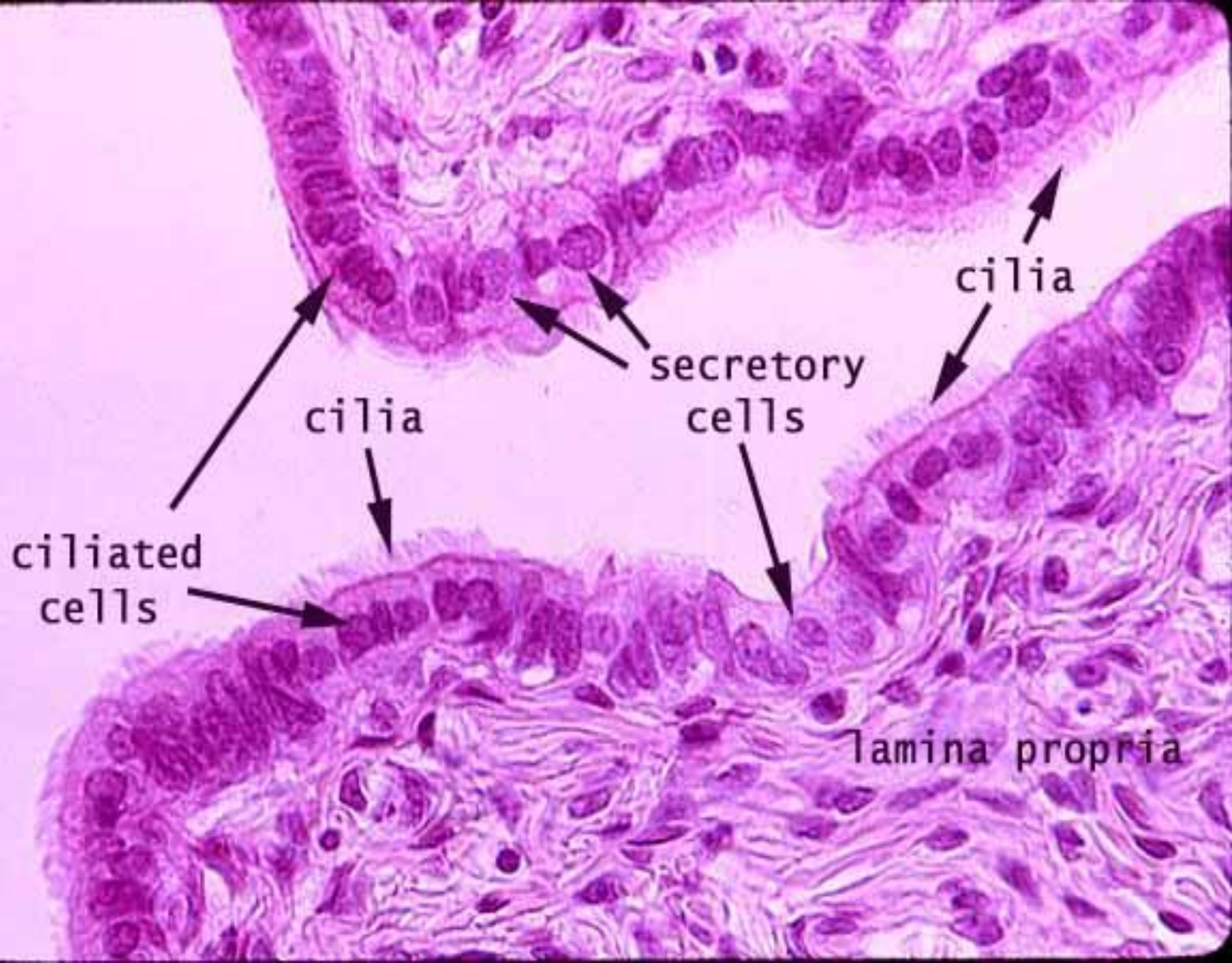
Mucosal folds

smooth muscle



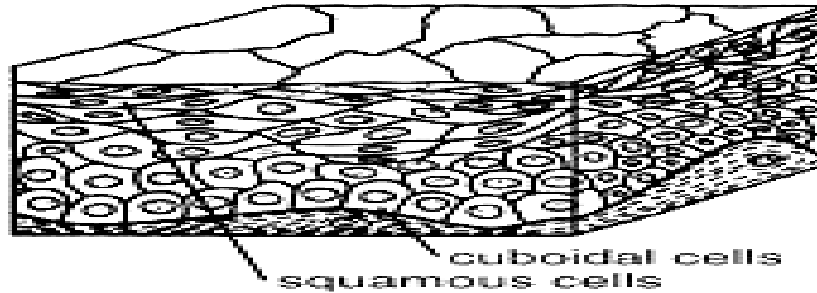






# Stratified epithelium

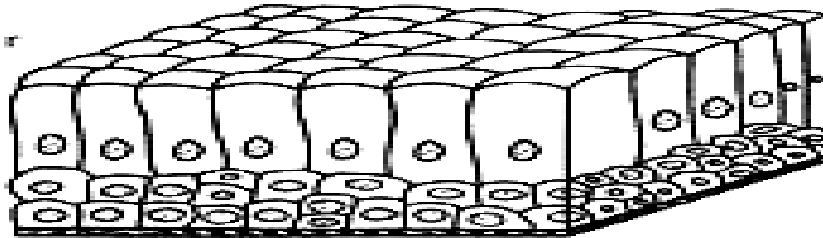
stratified squamous



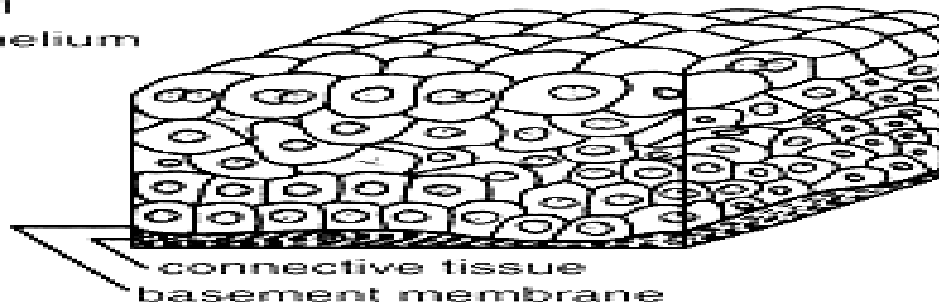
stratified cuboidal



stratified columnar



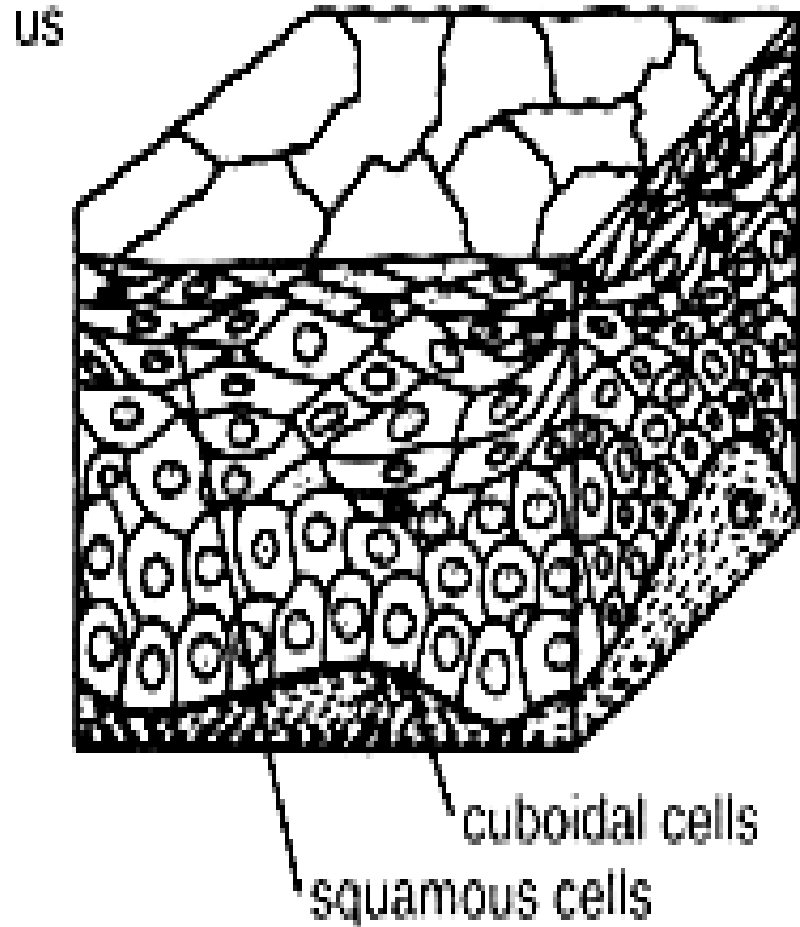
transitional  
epithelium

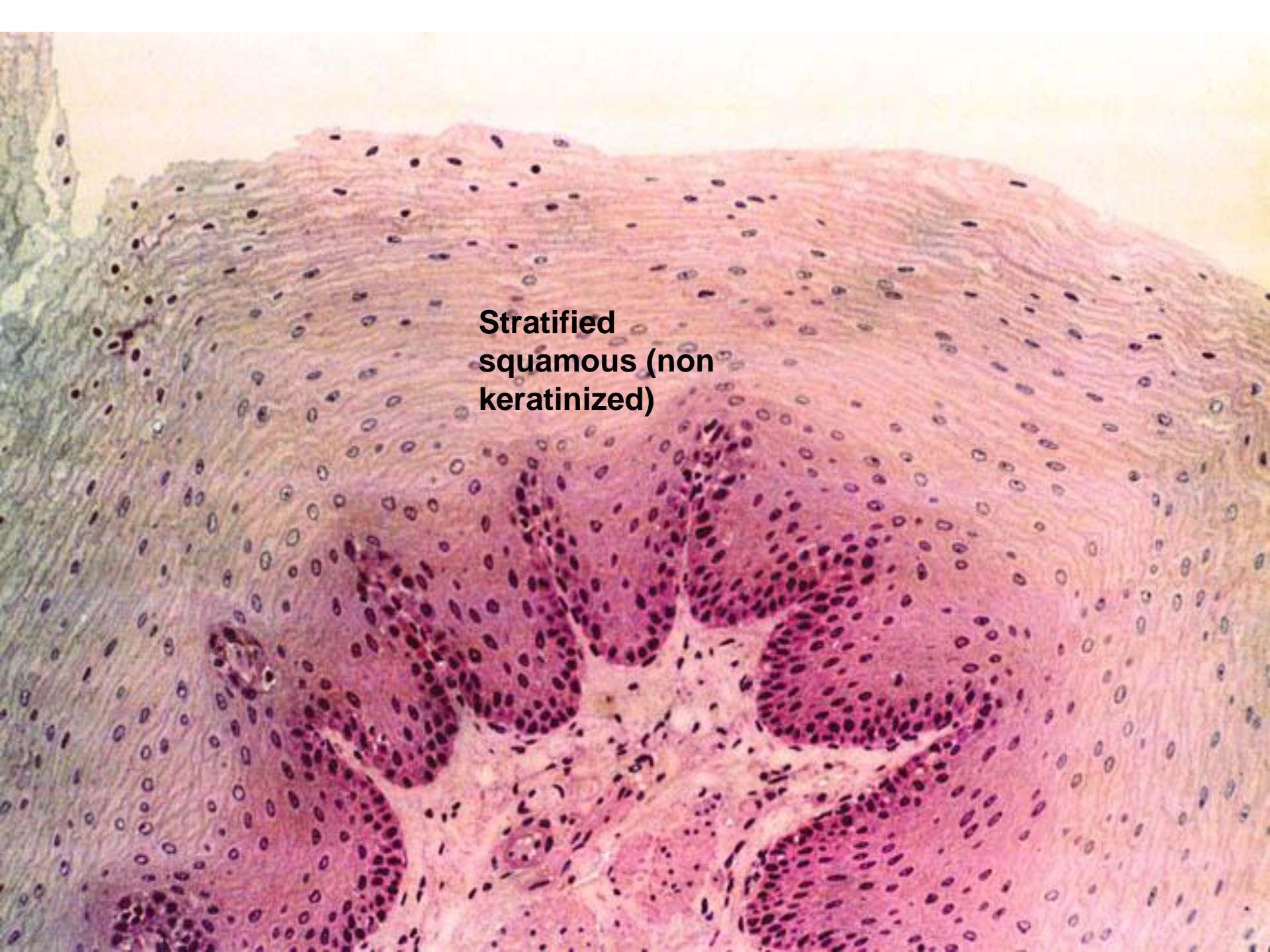




# Stratified Squamous Epithelium

- Multi layered squamous cells
- Keratinized-  
skin, tongue ;
- Non keratinized  
oral cavity esophagus  
vagina, cornea,  
anal canal



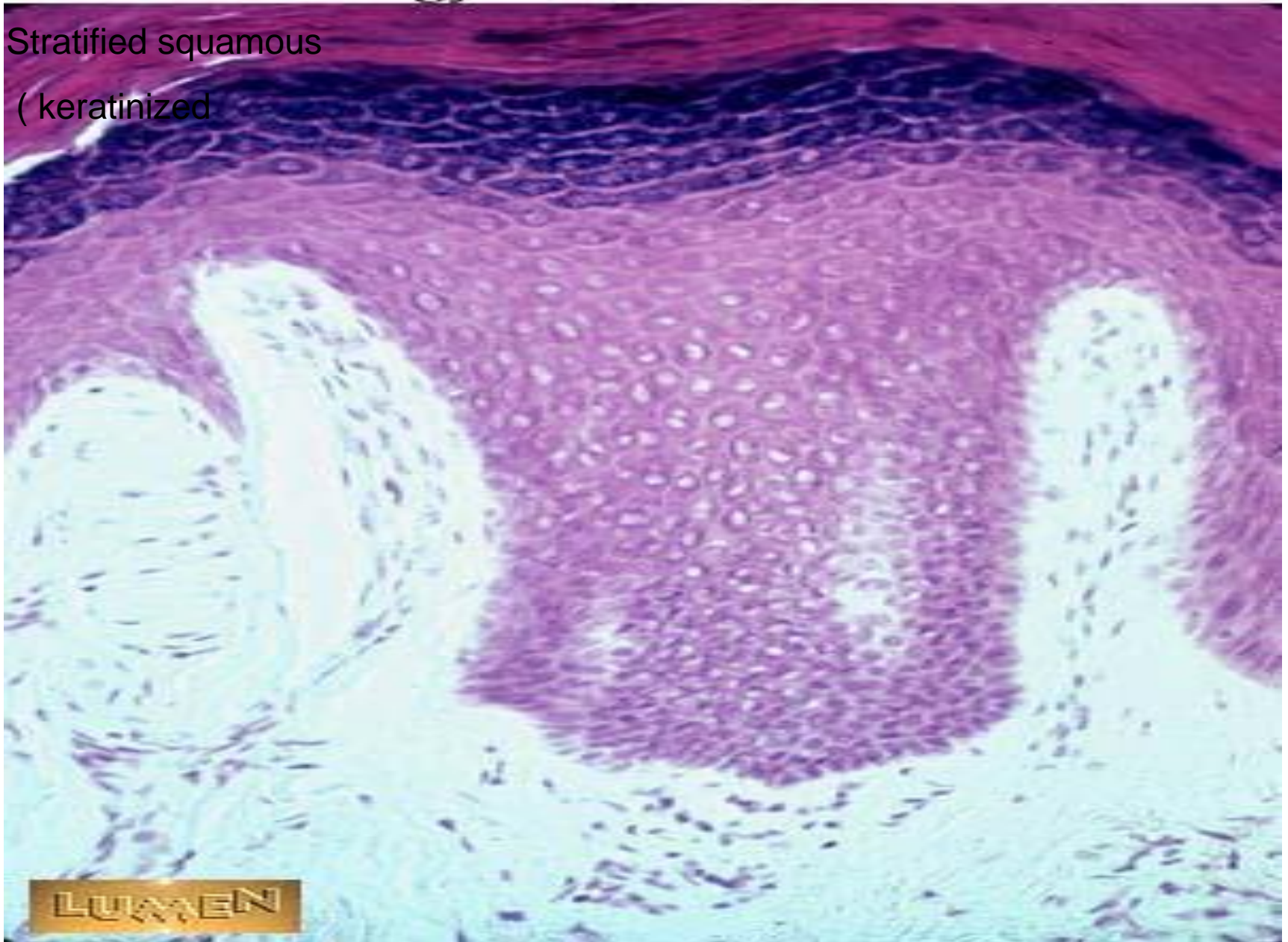
A histological micrograph showing a cross-section of stratified squamous non-keratinized epithelium. The tissue consists of multiple layers of cells. The surface layer is composed of flattened, squamous cells. The underlying layers are thicker and contain more rounded, polygonal cells. The overall appearance is pinkish-purple, characteristic of H&E staining. The text "Stratified squamous (non keratinized)" is overlaid on the image.

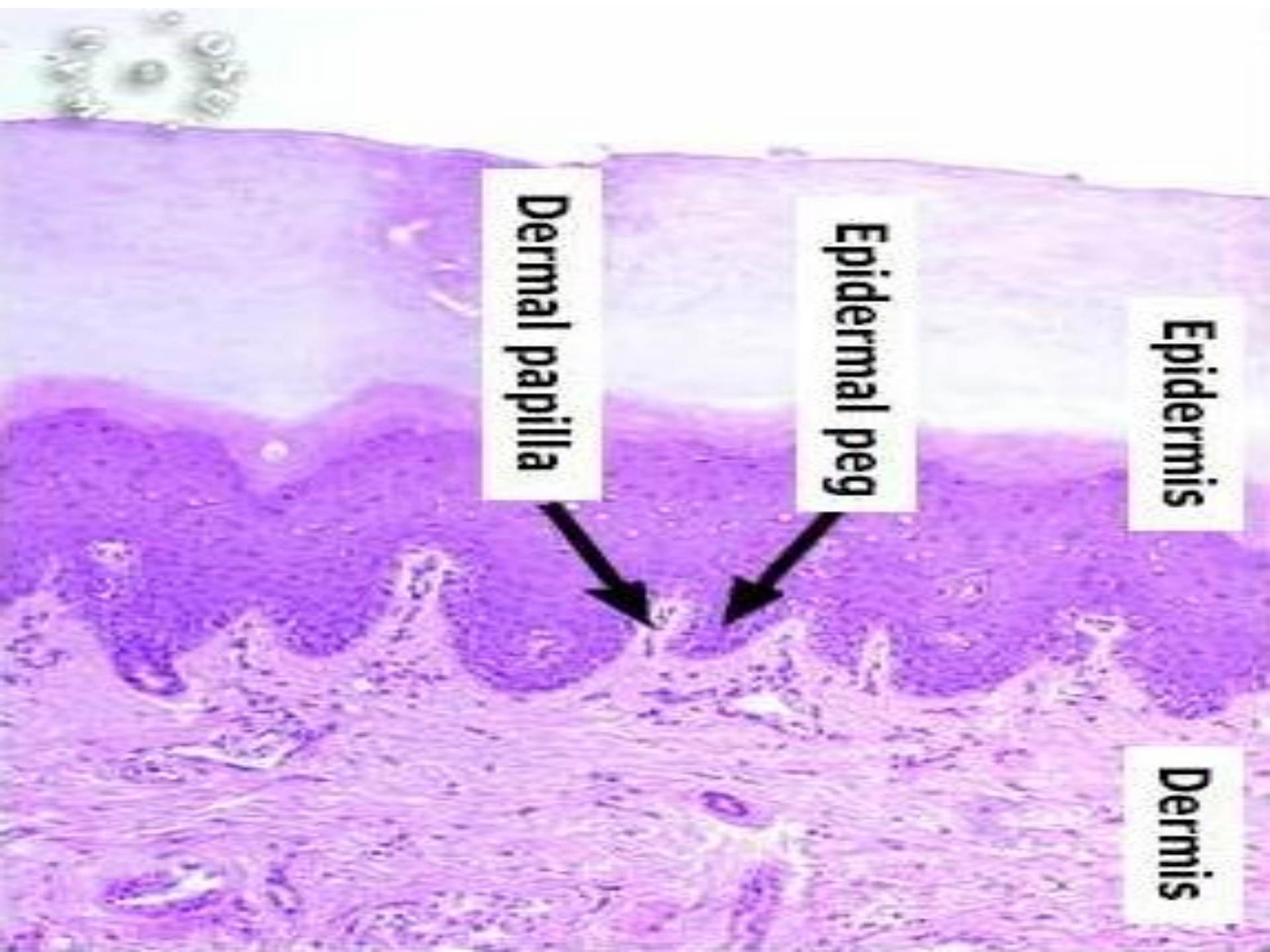
**Stratified  
squamous (non  
keratinized)**



## Histology Lab Part 13: Slide 20

Stratified squamous  
(keratinized)





**Epidermis**

**Epidermal peg**

**Dermal papilla**

**Dermis**

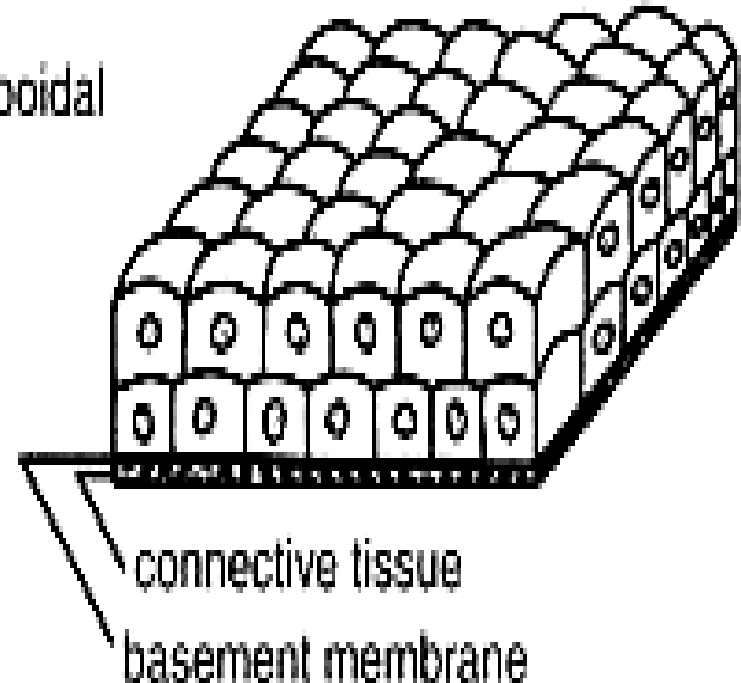
# Stratified cuboidal

*Cells:* two layers

*Nuclei:* centrally located,  
and spherical

*Functions:* absorption,  
secretion

stratified cuboidal



- **Examples—**
- **sweat gland ducts,  
graffiane follicle**



Ovary H&E

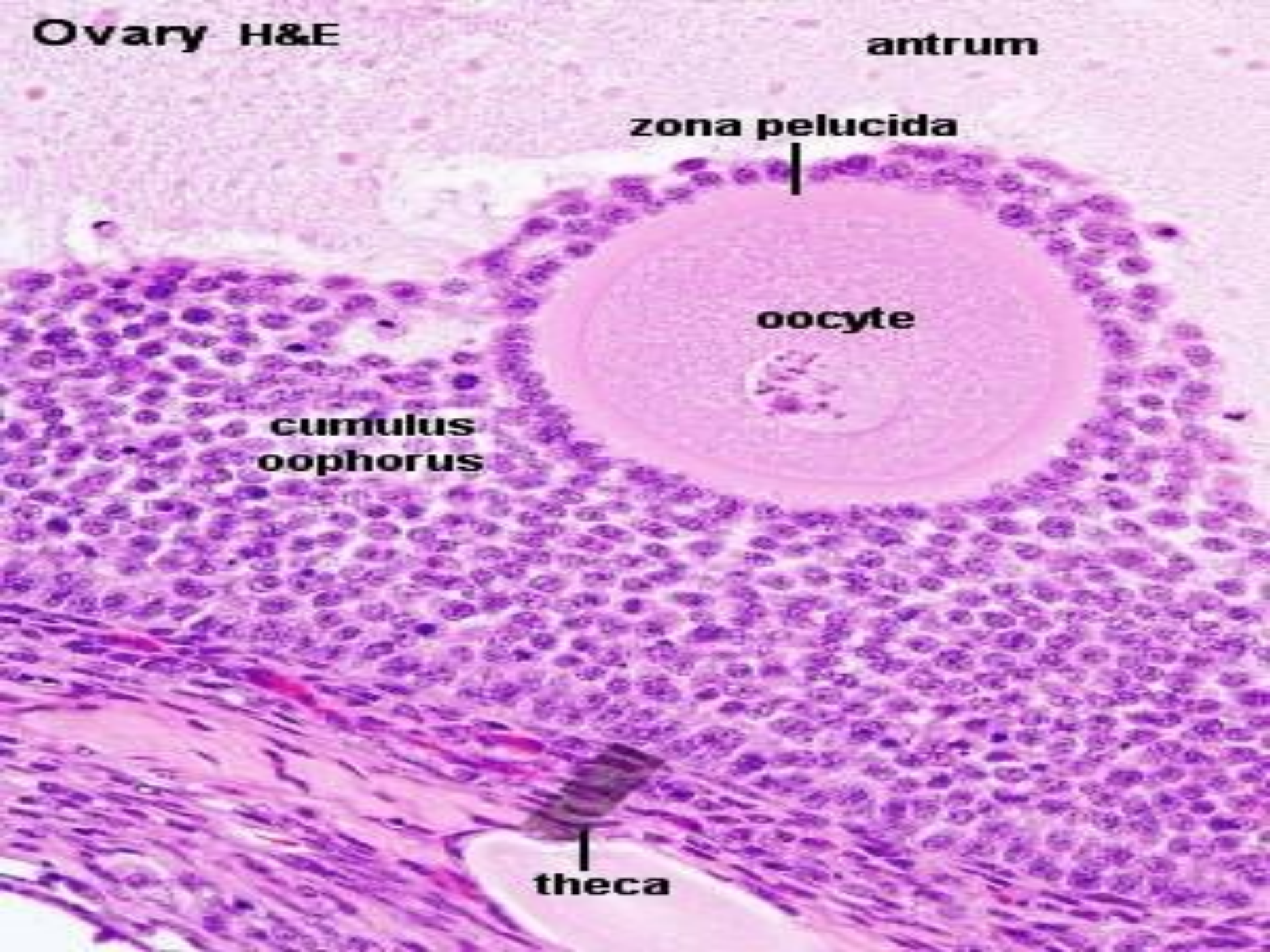
antrum

zona pelucida

oocyte

cumulus  
oophorus

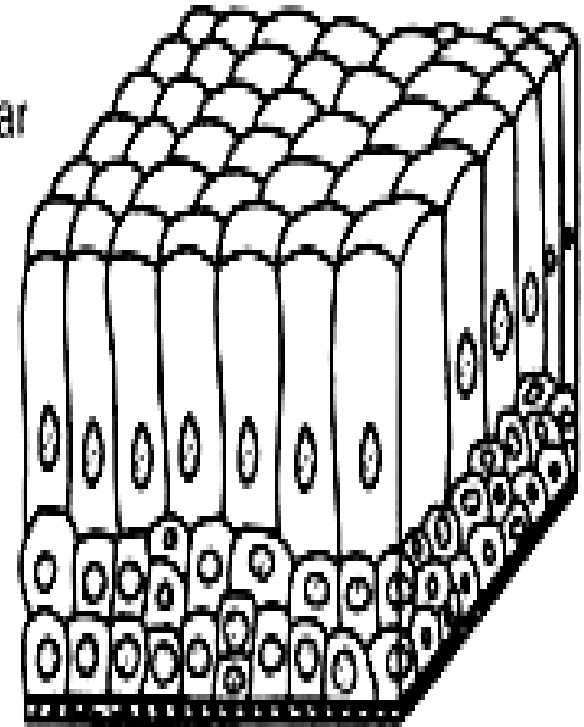
theca



# Stratified columnar-

- **Multilayered columnar cells**
- **Examples - palpebral conjunctiva**

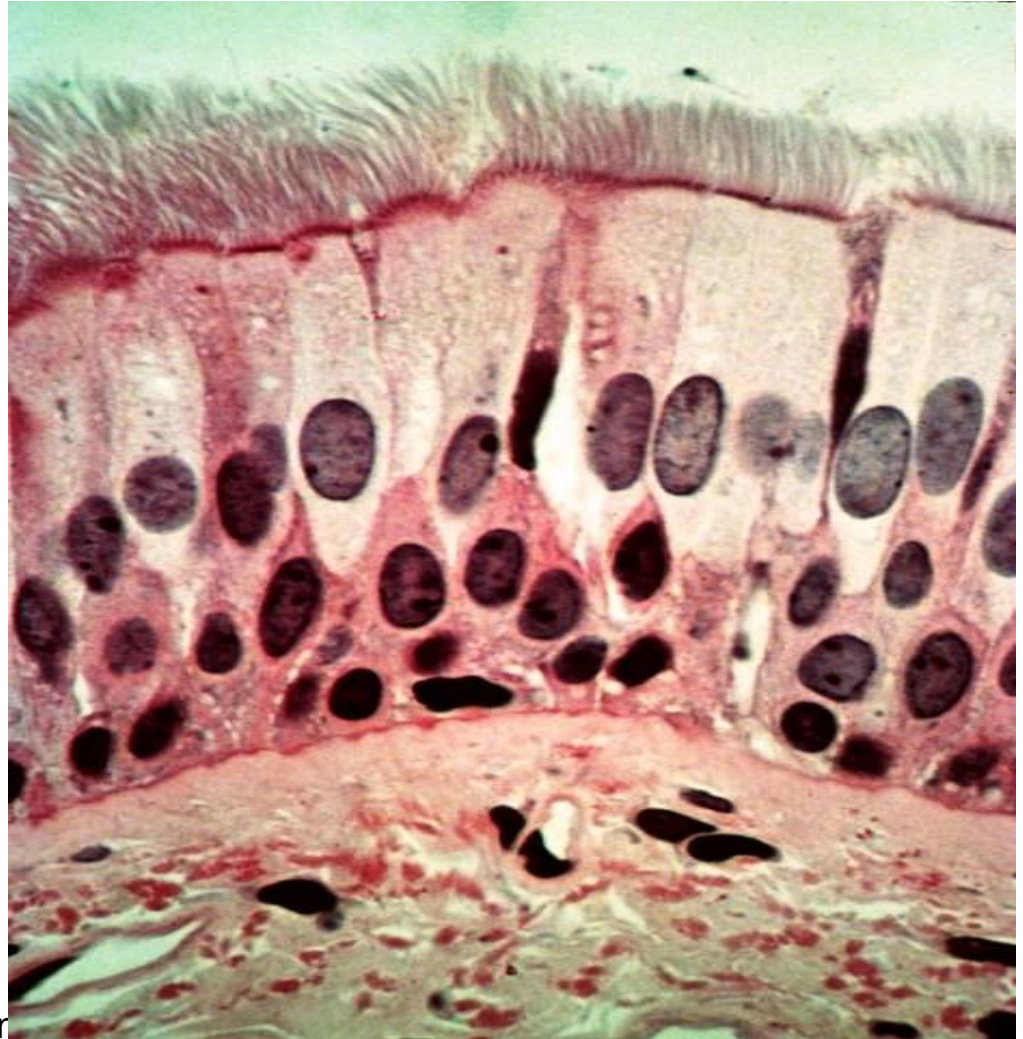
stratified columnar





# Pseudostratified epithelium

- **Cell of unequal heights resting on same basement membrane**
- **Examples**
- **Trachea, Bronchi, Auditory tube, Ductus deferens, Male urethra**

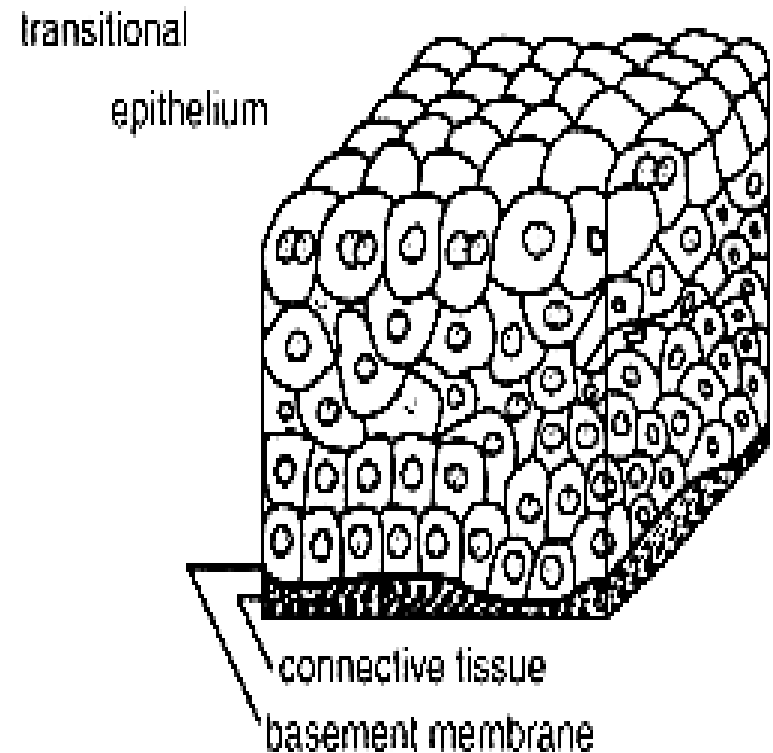


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# Transitional epithelium

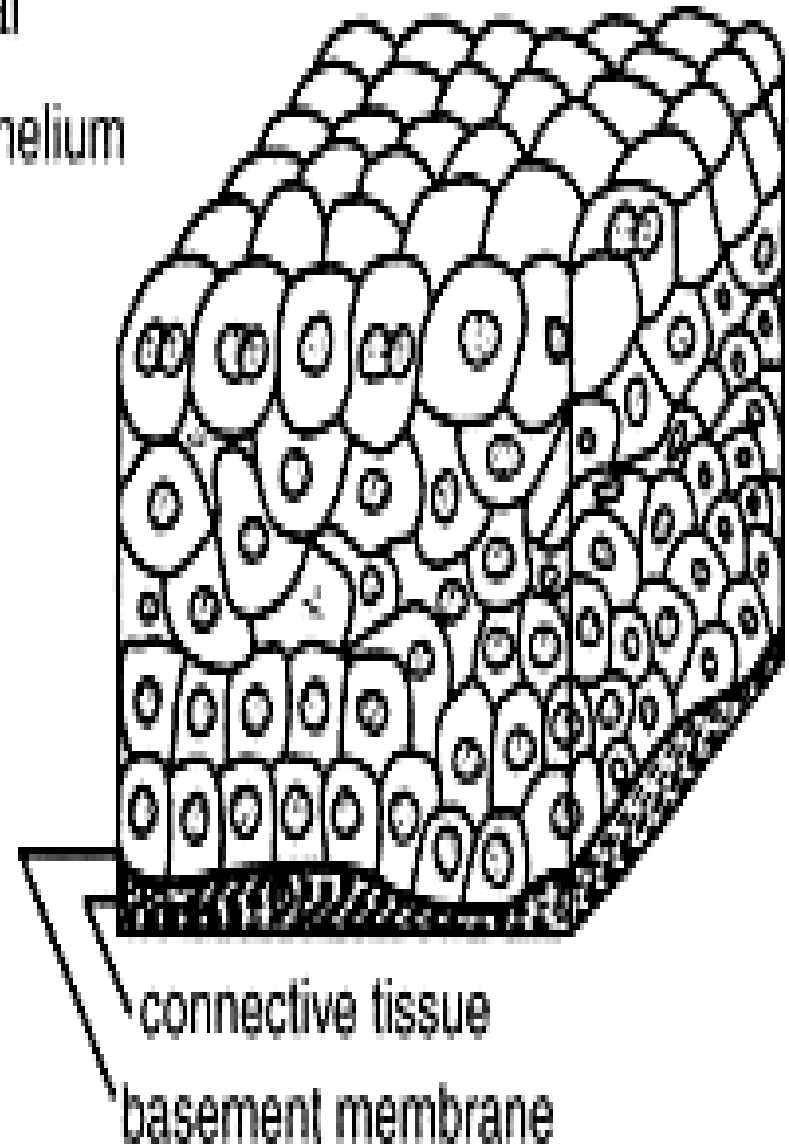
- **Layers**
  - **Basal layer**-columnar or cuboidal
  - **Middle layer**-pear or polyhedral cells (interdigiting layer)
  - **Outer layer**-rounded or umbrella cells
  - **Impervious layer**- dark stained material
- **Eg; ureter, urinary bladder**

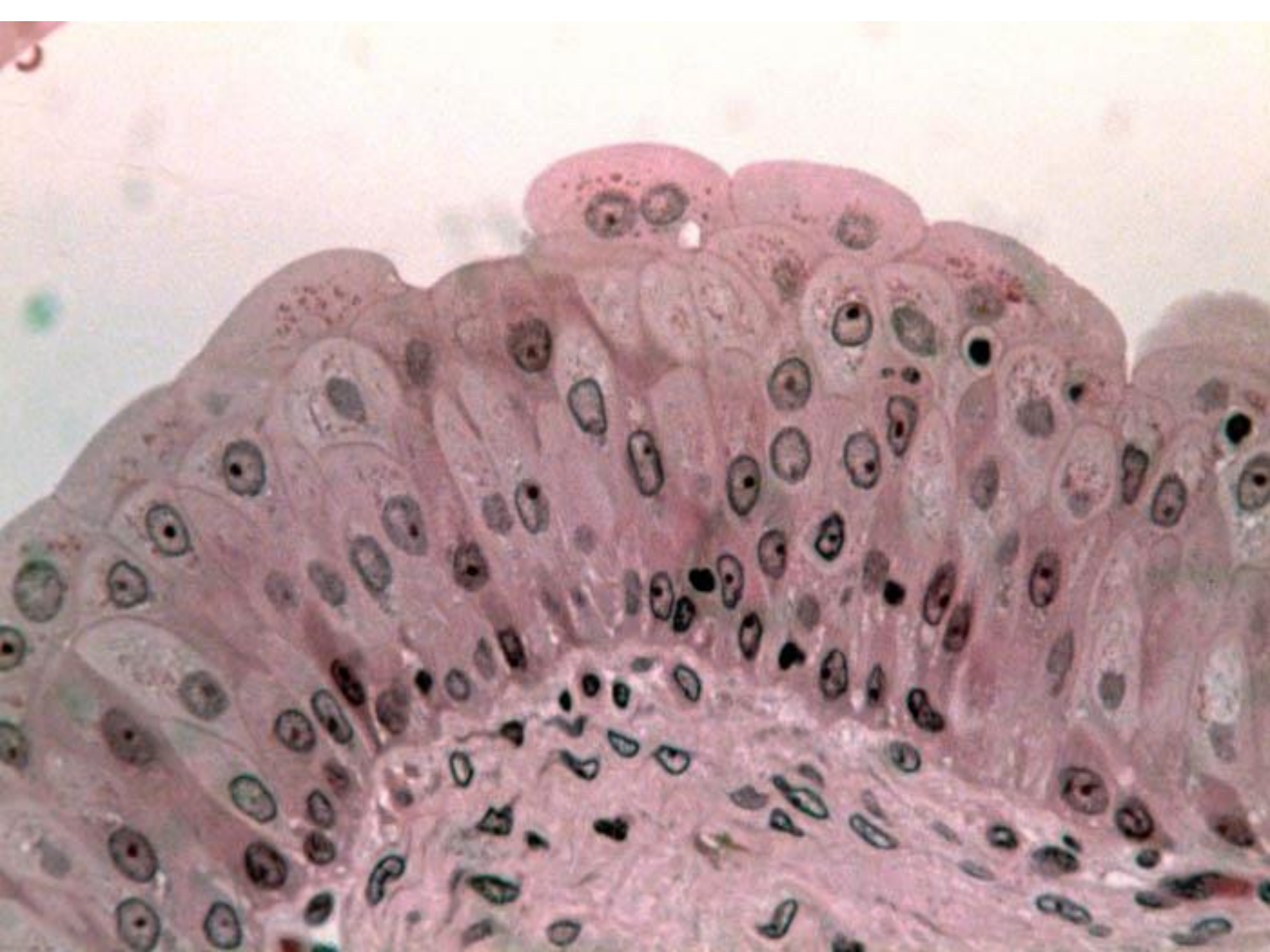




transitional  
epithelium

*Cells:* vary depending on stretch, apical cells often large, round, and bi-nucleated  
*Nuclei:* centrally located  
*Functions:* distention (occurs only in bladder, ureter, and urethra)







(a) Simple squamous

Basement membrane



(d) Pseudostratified (ciliated) columnar



(b) Simple cuboidal

Basement membrane



(c) Stratified squamous



(e) Simple columnar

Basement membrane



(f) Transitional



# EPITHELIUM

- **Classification on the basis of FUNCTIONS**
- **Lining epithelium**-*protection and absorption*
- **Glandular epithelium**-*secretion*
- **Neuro epithelium**- *sensation*
- **Myo epithelium** -*contraction*

***Thanks***

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